

REMARKS

Presently, claims 13-50 are pending. Applicants have amended claims 35-38, 43, 44, and 46. Support for the amendments can be found in the specification, for example, at page 6. No new matter has been added.

Applicants are filing an information disclosure statement concurrently with this preliminary amendment.

Claim Rejections under 35 U.S.C. §103

Claims 37, 13-16, 18, 20-24, 33, 35-36, 43-46, and 48-50 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,552,840 ("Ishii") in view of U.S. Patent No. 5,612,814 ("Yang"). Claims 17 and 47 were rejected as allegedly being unpatentable further in view of U.S. Patent No. 6,280,034 ("Brennesholtz"). Claim 34 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishii in view of Yang and U.S. Patent No. 6,857,747 ("Pentico").

Claims 37-43, 45-46, 48-50, 13-16, 19, 23, 25-33, and 36 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,490,087 ("Fulkerson") in view of Yang.

Independent claims 37 and 38 are directed to respective systems that require display panels that each include "a micro dichroic filter array, wherein elements of each micro dichroic filter array are configured to transmit a corresponding filtered portion of a light beam, the filtered portions being reflected within the display panel and at least some of the filtered portions being modulated within the display panel so that the polarization of those filtered portions is changed when leaving the display panel, the elements of each micro dichroic filter array being further configured to reflect corresponding unfiltered portions of the light beam so that the polarization of the unfiltered portion is not changed when leaving the display panel."

Independent claim 43 is directed to a method that requires "directing a first beam to reflect from a first color liquid crystal on silicon (LCoS) display panel and a second beam to

reflect from a second color LCoS display panel," where the first and second color LCoS display panels each comprise such a micro dichroic filter array.

Applicants traverse the rejections for the following reasons.

Patentability of claims 37 and 43 in view of Ishii and Yang

With respect to Ishii, the Office action refers specifically to an embodiment for an LCD element that "uses colored microfilters (999a, 99b, 99c)" as shown, e.g., in FIG. 7. (Office Action at §2.)

In general, Ishii discloses a projection type liquid crystal display using a beamsplitter 70 and reflective liquid crystal display (LCD) elements 12 and 12'. The embodiment shown in Fig. 7 includes the following features on top of a monocrystalline silicon substrate 91 (seen in direction of the incident light):

- a transparent glass substrate 95,
- a transparent counter electrode 95a,
- a liquid crystal 92,
- a gelatin film formed on the entire surface of the monocrystalline substrate 91 and having colored portions, which act as filter 94a-94c, and an undyed region 94d, and electrodes 94, which function as reflective films and are positioned below the dyed portions 94a-94c of the liquid crystal.

Within the monocrystalline silicon substrate 91, switching circuit and memory circuit regions 93 are covered by the electrodes 94. (Ishii, column 13, lines 39-65)

As shown in the embodiment of Fig. 7, the light passes through the liquid crystal 92 before it is filtered by the colored portions. Thus, only the light transmitted by the colored portions is reflected back into the beam splitter 70 by the electrodes 94 while the remaining light is absorbed in the colored portions.

The Examiner admits that "Ishii et al. does not teach the use of dichroic filters as the filter means," but states that – in view of Yang's "use of dichroic color filter means (220) adjacent a reflective image modulator" – "[i]t would have been obvious to one skilled in the art at the time

of the invention to modify the device of Ishii et al. by the substitution of dichroic filter means for dye filters in order to reflect undesired colors and avoid heat buildup caused by absorption” (Office Action, §2).

Applicants respectfully disagree. Applicants do not concede that a person of ordinary skill would have been motivated to modify the devices disclosed by Ishii et al. based on the disclosure of Yang. Nevertheless, even if such motivation existed, the result would not have been a system including all the limitations of the claims.

Specifically, as would have been understood by a person having ordinary skill in the art, the combined device would not "reflect an unfiltered portion of the light beam so that the polarization of the unfiltered portion is not changed when leaving the display panel" as required by the amended claims because, assuming the array of pixel filters 220 as a dichroic filter replaced for the gelatin film, the combined device would have an array of pixel filters positioned between the liquid crystal 92 and the electrodes 94. Thus, as would be appreciated by a person having ordinary skill, both the transmitted and reflected light would pass through the liquid crystal 92. Accordingly, and contrary to the language of the amended claims, the transmitted and the reflected (i.e., not-transmitted) light would be both modified in its polarization through interaction with the liquid crystal.

In summary, neither Ishii nor Yang, either alone or in combination, disclose or suggest systems or methods that include all the limitations set forth in claims 37 and 43, respectively. Nor would one of ordinary skill have been motivated to modify the systems and methods disclosed in Ishii to include all the limitations set forth in claims 37 and 43. Accordingly, applicants submit that claims 37 and 43 are not obvious in view of the combination of Ishii and Yang and ask that the prior art rejection of these claims be withdrawn.

Patentability of claims 37, 38, and 43 in view of Fulkerson and Yang

In the Response to Arguments, the Office action relies on the "structure of Fulkerson which forms the basis for the rejection." The Office action relies on Yang "to teach the provision of micro-filters in conjunction with LCD panels to form full color images from a single display." (Office Action at page 6.)

Applicants respectfully disagree. Specifically, as discussed above, Yang discloses a single array 250 of actuated mirrors 230 that is used in conjunction with an array of MxN pixel filters 220. Thus, applicants can not find any disclosure in Yang of an LCD panel that is used with an array of pixel filters "to form a full color images from a single display" as alleged in the Office action.

Moreover, Fulkerson discloses a first structure that uses monochrome illumination through a color wheel and comprises a polarizing beam splitter 5, a light source 16, and reflective LCDs 8 and 9 (Fulkerson, FIG. 2). Fulkerson also discloses a second structure that includes three LCD panels, polarizing beam splitters, and a dichroic prism 38. Further, Fulkerson discloses that a "thin film [color] filter can be used in front of each of the blue and red LCD panels to clean up any residual light of the wrong color which gets through the dichroic diagonal of dichroic prism 38." (id., FIG. 10 and col. 9, lines 1-31.)

A person having ordinary skill in the art would not have been motivated to modify the structures disclosed by Fulkerson to include a filter array at all, let alone a microdichroic filter array, because Fulkerson discloses illuminating his LCD panels with light of "one" color. Thus, as would have been appreciated by a person having ordinary skill in the art, each LCD panel in Fulkerson's systems operate as a monochrome display panel, and a single filter element, rather than an array, would suffice. Moreover, , when implementing a micro dichroic filter array, one would use an optical component that is more complex, and therefore likely more expensive, than the single dichroic filters disclosed by Fulkerson, defeating stated objectives of Fulkerson's – to provide optical systems that are "mechanically simple" and "minimize[] the use of expensive optical components" (Fulkerson, col. 2, lines 11-21).

In summary, neither Fulkerson nor Yang, either alone or in combination, disclose or suggest a system or method that include all the limitations set forth in claims 37, 38, and 43, respectively. Nor would one of ordinary skill have been motivated to modify the systems and methods disclosed in Fulkerson to include all the limitations set forth in claims 37, 38, and 43. Accordingly, applicants submit that claims 37, 38 and 43 are not obvious in view of the combination of Fulkerson and Yang and ask that the prior art rejection of these claims be withdrawn.

At least for the foregoing reasons, claim 37, 38, and 43 as well as their dependent claims should be allowed.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants submit that all claims are in condition for allowance, which action is requested. The fee for the Three-Month Extension of Time of \$525.00 is being filed concurrently with the Electronic Filing System (EFS). Please apply any charges or credits to deposit account 06-1050, referencing Attorney Docket No. 17707-002US1.

Respectfully submitted,

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